



Non-Lethal Weapons: Technologies, Concepts and Strategies

***A Course of Instruction
at the***

Presented by: Military War Colleges

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Outline

- **Course Genesis**
- **Course Composition**
- **Venues**
- **Student Scenarios**

Course Genesis

- **The course was created in 1998 after the formation of the Institute for Non-Lethal Defense Technologies at Penn State.**
- **The course was created and is taught by Penn State and offered for presentation at various DoD military colleges.**
- **The purpose of the course is to expose field commanders and staff officers to the capabilities and limitations of non-lethal weapons across the spectrum of conflict.**

Course Composition

- **The course is 24-30 hours of instruction depending on the academic venue.**
- **It is composed of both classified and unclassified lectures by subject matter experts and is currently only open to U.S. students.**
- **DoD and industry subject matter experts provide lectures on non-lethal technologies and/or the implications of their use.**

Course Overview

- **The course covers:**
 - **the history of the non-lethal weapons program**
 - **current military uses of NL weapons**
 - **threat non-lethal weapons**
 - **current/future DoD non-lethal weapons programs**
 - **the status of non-lethal technology development**

Course Overview

- **The course also covers the implications of non-lethal weapons use.**
 - **political implications**
 - **rules of engagement**
 - **public perception - awareness**
 - **ethical considerations**
 - **legal implications**
 - **impact on policy, strategy and doctrine**
 - **support to Homeland Defense**

Resources

- **Future War: Non-Lethal Weapons in 21st Century Warfare by Col John Alexander, USA (Ret)**
- **Studies and Assessments of Non-Lethal Technologies by Independent Research Organizations**
- **Military Journal Papers**
- **Press Articles**

Non-Lethal Course Venues



- **National Defense University**
 - **First non-lethal class conducted in 1999.**
 - **Two classes held in 2004.**
 - **Total of 48 students have taken the course.**

Non-Lethal Course Venues



- **Marine Corps Command & Staff College**
 - **Five courses conducted since 2000.**
 - **Total of 74 students have taken the course.**



Non-Lethal Course Venues

U.S. ARMY WAR COLLEGE
at historic Carlisle Barracks, Pennsylvania

- **Army War College**
 - **First course conducted in 2004.**
 - **Total of 22 students have taken the course.**

2005-2006 Non-Lethal Course Venues



U.S. ARMY WAR COLLEGE
at historic Carlisle Barracks, Pennsylvania

- April - June 2005
- April - June 2006



THE NATIONAL WAR COLLEGE

- Sept - Nov 2005
- Jan - Mar 2006



INDUSTRIAL COLLEGE OF THE ARMED FORCES

Marine Corps Command & Staff College



- Jan - Mar 2006



- AY 2005 - 2006



- Aug - Oct 2005
- Spring 2006

2005-2006 Venues In-Work



- **AY 2005 - 2006**



- **AY 2005 - 2006**

Command & General
Fort Leavenworth, Kansas
Staff College

Students

- **Majors/LtCdrs - LtCol/CDR - Colonel/Captain**
- **Representation from all combat and supporting arms.**
- **GS-14/GS-15s from OSD and the military services.**
- **90% of the students start the course as skeptics.**
- **99% of the students leave the course as advocates.**

Student Non-Lethal Scenarios

- **Course final exam.**
- **Student teams are tasked to develop a scenario based on historical, current or future events.**
- **Scenario must integrate non-lethal technologies and show how their use would impact mission accomplishment.**
- **Student teams present their scenarios to a flag level panel of subject matter experts from the military and federal/state agencies.**

Student Non-Lethal Scenarios

- **1975 Evacuation of Saigon Embassy**
- **Maritime Interdiction**
 - **Piracy in SE Asia**
 - **Enforcing UN Sanctions Against Iraq**
- **Embassy Protection - Crowd Control**
 - **South America**
 - **Middle East**
- **Humanitarian Operations**
 - **LZ Protection - Food Distribution Point**
 - **Earthquake Relief**

Student Non-Lethal Scenarios

- **Humanitarian Operations**
 - **Convoy Protection**
- **Non-Combatant Evacuation Operations**
- **I MEF Security of Iraqi Elections**
- **2001 Presidential Inauguration**
- **Port Security**
 - **Long Beach**
 - **San Francisco**
- **Athens Olympics**
- **USS Cole**

Student Non-Lethal Scenarios

- **Special Operation Forces - Snatch/Grab in Afghanistan**
- **Aircraft Hijacking**
 - **1985 TWA Flt 847**
 - **Prevention**
- **Hostages**
 - **29 May 04 takeover of Saudi Arabian housing compound**
- **1970 Kent State**
- **1863 New York Draft Riots**
- **Vehicle Checkpoint**
 - **Humanitarian Operations**
 - **An Najaf, April 2003**

NON-LETHAL WEAPONS



**Col Bill Wetzelberger,
USMC**

**COL Charles Tennison,
USA**

ITC Steph Twitty, USA

**TASK FORCE 3-15 INFANTRY
CIVILIAN VAN INCIDENT
ALONG HIGHWAY 9, AN NAJAF**

SCENARIO

- **Task Force 3-15 Infantry located in blocking positions along HWY 9**

vicinity of An Najaf in order to prevent enemy forces from flanking Task

Force 4-64 AR from the north.

- **Heavy fighting along HWY 9 between TF 3-15 IN and Iraqi soldiers in**

civilian cars / technical trucks

- **Two US Soldiers killed the day prior by suicide bomber at a checkpoint**

- **Guidance to company commander:**

- **Three blocking positions established with B/3-15 IN.**
- **Prevent enemy forces from using HWY 9 to envelope main effort**
- **Establish three-tier check point with concertina wire**

SE Iraq Route Map

OBJ LIONS

OBJ SAINTS

From	To	Kilometers	Nautical Miles
Al Jahra	Umm Qasr	86	46
Al Jahra	Al Basrah	133	72
Al Jahra	An Nasiriyah	232	125
Al Jahra	Qalat Salih	240	130
Al Jahra	Al Amarah	284	153
Al Jahra	As Samawah	316	171
Al Jahra	Al Kut	393	212
Al Jahra	An Najaf	433	234
Al Jahra	Karbala	502	271
Al Jahra	Baghdad	540	291

IRAN

OBJ CHATHAM

HISTORY OF INCIDENT

Van and car moving SE at approx 80 miles an hour. Both vehicles blow thru 1st tier of CP, 2nd tier fires warning shot and radiator shot. 3rd tier fires final shot to kill after vehicles proceed thru concertina wire manned by soldiers

Kuwait

WHAT HAPPENED?

**Direction of travel
of van**

**Two Bradley Fighting Vehicles (BFV)
positioned north and south of the
road
as 2nd tier CP fire warning and
radiator shots to disable van. Van
proceeds through Concertina wire
strung across road.**

**Two US Soldiers located in
dug-in fighting positions
along south side of the
road attempt to halt
van by waving it down.**

**Two BFVs positioned north and south
of the road engage to destroy the van.**

0 50 75 Meters

3/15/05

The diagram illustrates a tactical engagement on a road. A black line represents the road, which curves from the top left towards the bottom right. A green arrow at the top left points along the road, indicating the 'Direction of travel of van'. Two black triangles are positioned north of the road in the upper left. Two US soldiers, represented by black diamond shapes with flags, are in dug-in positions on the south side of the road, with a red arrow pointing to them from a text box. Two Bradley Fighting Vehicles (BFVs), also represented by black diamond shapes with flags, are positioned north and south of the road further along, with a red arrow pointing to them from a text box. Green squiggly lines represent 'Concertina wire' strung across the road in two locations. A scale bar at the bottom is marked with 0, 50, and 75 meters. The date '3/15/05' is written below the scale bar.

NON-LETHAL WEAPONS

(Recommended Devices)

- To prevent vehicle from breaking through check points
 - Vehicle Lightweight Arresting Device (British version)
 - Caltrops / Road Spikes
 - Portable Barriers / Portable Vehicle Arresting Barrier
- Provides protection against suicide bombers
- Can be used to slow, block, or maze vehicles
 - Hasco / Jersey Barriers
- Long Range Acoustic Device:
 - Notify civilians of obstacles and to halt vehicle

OPERATIONAL AND STRATEGIC LEVEL IMPACT

- **WINS HEARTS AND MINDS OF THE IRAQI PEOPLE**
- **PREVENT WORLD OUTCRY / MEDIA ATTENTION**

Vehicle Lightweight Arresting Device

■ Description

- Road spikes in mesh blanket
- Entangles wheels/axles

■ Advantages

- Small / light weight
- Portable / rapidly deployed
- Reusable / low cost
- *Easier to handle than caltrops*

■ Disadvantages

- Loss of control of vehicle (swerving to avoid blanket)
- *Time to detangle -- Unavailable for immediate follow-up attack*



Caltrops

■ Description

- 4-prong iron spike (deflates tires)
- Always lands in upright position when s
- Hollow--can puncture self-sealing tires

■ Advantages

- Small / Light weight
- Rapidly Deployable
- Reusable / Low Cost

■ Disadvantages

- *Laceration risk (to handle,*
- Time / distance to stop vehicle
- Loss of control of vehicle (particularly if only one tire is blown)
 - » Vehicle may crash into some other barrier, injure pedestrians/occupants
- *Need a large quantity to cover wide area*



"Scatterjacks" ←

Road Spikes

■ Description

- Flexible or rigid rows of spikes (deflators)
- Can also place under a vehicle being s

■ Advantages

- Small / light weight
- Portable / rapidly deployed
- Reusable / low cost
- *Easier to handle than caltrops*

■ Disadvantages

- Stability during successive attacks
- Time / distance to stop vehicle
- Loss of control of vehicle (swerving to av
 - » Vehicle may crash into another barrier, injure pedestrians/occupants



MagnumSpike



LazyTons



Portable Barriers / Jersey Barriers

- **Description**
 - **Manual / automatic pop-up road blocks**
- **Advantages**
 - **Stopping Power**
 - **Remote control activation**
 - ***Selective targeting***
- **Disadvantages**
 - **Generally permanent**
 - **Expensive**
 - **Requires dedicated prime mover**



RisingKer

bs

3/15/05

- **Description**
 - **Concrete/Plastic road blocks**
 - **Used to stop (or slow) vehicle**
- **Advantages**
 - ***Stopping power***
 - **Can be filled with water, sand, or other materials**
 - **Reusable - relatively low cost**
- **Disadvantages**
 - ***Heavy***
 - ***Targeted***



4/0

Portable Vehicle Arresting Barrier

- **Description**
 - **Highly effective vehicle stopping “net”**
- **Advantages**
 - **Stopping Power**
 - **Allows normal traffic flow**
 - ***Selective targeting***
- **Disadvantages**
 - **Time to set up**
 - **Not easily transported**



High Intensity Directional Acoustics

- **Modes of operation:**
 - **Broadcast sound files for warnings**
 - **High pitched, 150 decibel, narrow-beam tone for crowd control**
- **Easily transportable and employable**
- **Requires energy source (generator)**
- **Long Range Acoustic Device (LRAD)**
 - » **Limited fielding in Iraq**



Technologies Assessment

	Effect on Target *	Selective Targeting	Portability	Range	Cleanup	Maturity	Synergy	Cost	Robustness	Legal
Caltrops										
Road Spikes										
Jersey Barriers										
Portable Barriers										
Portable Vehicle Arresting Barrier										
Vehicle Lightweight Arresting Device										
High Intensity Directional Acoustics										

= *When target confined to limited area* **force**
 = *** All need to be backed up with let*
 =

WHAT COULD HAVE HAPPENED

**Direction of travel
of van**

- Vehicle Arresting Device
- Portable barrier
- CALTROPs
- Road Spikes
- To stop vehicle

**Two Bradley Fighting Vehicles (BFV)
positioned north and south sides of
road as 2nd tier.**

- Long Range Acoustic Device
 - to notify van to halt
- Hasco Barriers
- Jersey Barriers
 - to slow vehicles

- Hasco Barriers
- Jersey Barriers
 - to slow vehicles
- Vehicle Arresting Device
- CALTROPs
 - To stop vehicles

**Two BFVs Positioned north and south sides
of the road as 3rd tier.**



PLANNING CONSIDERATIONS

- **Intel:**
 - **When fighting in vicinity of non combatant civilians, non lethal weapons should be considered**
 - **Civilian actions must be war-gamed as part of the overall ground plan**
 - **HWY 9 was the only major highway in vicinity of AN Najaf.**
- **Logistics:**
 - **Consider impact on load plan and availability of transportation**
 - **Must have a plan to transport desired non-lethal weapons in theater**
 - **limited transportation assets at battalion level**
- **Legal:**
 - **ROE**
- **Public Acceptance:**
 - **Must be ready to explain your actions to civilians**
 - **Maintain public support by reducing civilian casualties**

Summary

- **The non-lethal course has been very well received by the students.**
- **The course has been a means to expose the future leaders of DoD on the advantages and limitations of non-lethal technologies.**
- **The student scenarios have provided a forum between today's federal and state agencies to discuss non-lethal technologies within an academic environment.**